CLAIMS

1. A method of identifying an agent that modulates bone formation comprising:

(a) administering a test agent; and

(b) monitoring expression of ΔFosB to determine whether the agent modulates bone formation.

2. The method of claim 1, wherein the agent is administered to isolated cells in culture.

3. The method of claim 2, wherein the cells are osteoblasts or chondrocytes.

4. The method of claim 3, wherein the cells are primary osteoblasts, MC3T3-E1 cells, or C2C12 cells.

5. The method of claim 1, wherein the agent is administered to a non-human transgenic animal.

6. The method of claim 5, wherein the transgenic animal is a mouse.

7. The method of claim 5, wherein the transgenic animal can be induced to overexpress ΔFosB.

8. The method of claim 1, wherein the agent is administered to cell lysates.

9. A method of identifying an agent that modulates adipogenesis comprising,

(a) administering a test agent; and

(b) monitoring expression of ΔFosB to determine whether the agent modulates adipogenesis.

10. The method of claim 9, wherein the agent is administered to *in vitro* cells expressing ΔFosB.

11. The method of claim 10, wherein the cells are selected from the group consisting of primary adipocytes and 3T3-L1 preadipocytes.

12. The method of claim 9, wherein the agent is administered to a non-human transgenic animal.

13. The method of claim 12, wherein the transgenic animal is a mouse.

14. The method of claim 12, wherein the transgenic animal can be induced to overexpress ΔFosB.

15. The method of claim 9, wherein the agent is administered to cell lysates.

16. A method of inducing osteoblast formation comprising administering an agent that increases ΔFosB expression in pluripotent precursor cells.

17. A method of inhibiting adipocyte formation comprising administering an agent that increases ΔFosB expression in pluripotent precursor cells.

18. A method of treating osteosclerosis comprising administering an agent that inhibits ΔFosB expression.

19. A method of increasing bone formation in a patient comprising administering an agent that induces ΔFosB.

20. The method of claim 19, wherein the patient is suffering from bone fracture, osteoporosis, or hyperparathyroidism.

21. The method of claim 1 or 9, wherein step (b) is performed using a yeast two-hybrid system.

22. The method of claim 1 or 9, wherein the expression of ΔFosB is monitored by measuring expression of a reporter gene whose transcription is regulated by ΔFosB.

23. A method of identifying genes that are modulated by ΔFosB comprising

(a) inducing ΔFosB in a cell; and

(b) determining which genes are differentially expressed, thereby identifying genes that are modulated by ΔFosB.

24. The method of claim 23, wherein step (b) is performed using a yeast two-hybrid system or hybridization of cellular nucleic acids to a DNA chip.

25. A method of identifying genes that modulate ΔFosB expression comprising measuring the expression level of ΔFosB in the presence of test genes, thereby identifying genes that modulate ΔFosB.

26. The method of claim 25, wherein the test genes are in a nucleic acid library.

27. The method of claim 25, wherein the expression level of ΔFosB is determined by using Northern blot analysis, Western blot analysis, PCR analysis, or two hybrid screening assays, or a reporter gene system.

28. The method of claim 27, wherein the reporter gene system comprises a reporter gene linked to a promoter that interacts with ΔFosB.

29. The method of claim 25, wherein ΔFosB is linked to a heterologous protein.

30 The method of claim 25, wherein ΔFosB is encoded by a nucleic acid on a heterologous vector.